

	A	B	C	D	E	F
1	Study Title	Description	Background info	Study Variables	Analysis	Starting point
2	2D control	How can we extract 2 dimensions of control from EEG signal?	Homunculus Linear classification	1) hand motor imagery 2) tongue motor imagery 3) signal classification	2D cursortask performance	Started contact Colleen or Travis
3	Eyeblinks & Artifacts	How can we detect artifacts, like eyeblinks, and remove them?	EOG Artifact studies Multivariate statistics Pattern recognition	1) without artifact detection/removal 2) with artifact detection/removal	accuracy of artifact detection algorithm correlation map	Started contact Jenny or Amanda
4	Automated Feature Extraction	How can we automate the process of acquiring a signal and translating it into a control signal?	Motor imagery Spectral estimation Pattern recognition Script writing	unknown Algorithm type	Time to acquire signal cursortask performance	background reading
5	Spatial Filters	Which spatial filter is the best?	Spatial resolution of EEG signal 1997McFarland paper	Spatial Filter types	correlation map cursortask performance	background reading
6	Emotiv headset vs. full array	Can better results be produced with more, differently located, or gelled electrodes?	Spatial resolution of EEG signal Impedance of comparable EEG recording electrodes	1) Healthy subject vs Stroke subject A) research headset with saline B) research headset with gel C) emotiv headset	correlation map	background reading Contact David Bundy for access to research headset
7	Environmental Conditions	What external or subject-specific conditions affect performance of the BCI?	unknown Psychology of attention	1) Room Lighting 3) Subject restraint 2) Environmental noise level	correlation map for each condition	background reading set up experiment
8	Stimulus Type	What is the best stimuli to elicit motor imagery?	unknown Methods of other studies	1) Visual 2) Audio 3) Tactile	correlation map for each stimuli subjects rate stimuli on helpfulness	background reading set up experiment
9	Motor Imagery Comparison	What should a subject think about when tasked to do motor imagery?	unknown Methods, results of other studies	1) Finger tapping 2) Hand closure 3) Look at hand 4) Focus Visual Attention on Imagery	correlation map for each condition	background reading set up experiment
10	Population survey: who can generate motor imagery data?	How many can generate motor imagery on first try?	unknown results of other studies	1) Untrained subject 2) Trained subject	correlation map for each: subject/trial number Compare maps between	background reading set up experiment
11	Slow Signal Variation	How does signal location/correlated frequency vary with time/subject?	unknown results of other studies	Length of trial	sliding window of correlation map over time	Data collection Development of analysis

	A	B	C
1	Project Title	Description	Motivation
2	Gumstix	Migrate the signal processing and control conducted on laptop to a microcomputer	increased portability
3	Develop Simple Computer Interface	Develop a user interface for physical and occupational therapists	Product requires use by clinicians.
4	IpsiHand v2	Develop a second prototype of IpsiHand	IpsiHand requires more polish before it can become a product
5	Robot control	Control Robotic Sensing robots with emotiv headset	develop Labview interface with Emotiv